

Notice of Allowability

Application No.

10/079,334

Examiner

Jason M. Perilla

Applicant(s)

DE ET AL.

Art Unit

2611

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☒ This communication is responsive to the amendment filed July 30, 2007.
2. ☒ The allowed claim(s) is/are 1, 3-7, and 9-12 are renumbered respectively as claims 1-10.
3. ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
 - a) ☐ All b) ☐ Some* c) ☐ None of the:
 1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

* Certified copies not received: _____.

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.

THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.

4. ☐ A SUBSTITUTE OATH OR DECLARATION must be submitted. Note the attached EXAMINER'S AMENDMENT or NOTICE OF INFORMAL PATENT APPLICATION (PTO-152) which gives reason(s) why the oath or declaration is deficient.
 5. ☐ CORRECTED DRAWINGS (as "replacement sheets") must be submitted.
 - (a) ☐ including changes required by the Notice of Draftsperson's Patent Drawing Review (PTO-948) attached
 - 1) ☐ hereto or 2) ☐ to Paper No./Mail Date _____.
 - (b) ☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date _____.
- Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).
6. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

Attachment(s)

- | | |
|--|--|
| 1. <input type="checkbox"/> Notice of References Cited (PTO-892) | 5. <input type="checkbox"/> Notice of Informal Patent Application |
| 2. <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 6. <input checked="" type="checkbox"/> Interview Summary (PTO-413),
Paper No./Mail Date <u>20070816</u> . |
| 3. <input checked="" type="checkbox"/> Information Disclosure Statements (PTO/SB/08),
Paper No./Mail Date _____ | 7. <input checked="" type="checkbox"/> Examiner's Amendment/Comment |
| 4. <input type="checkbox"/> Examiner's Comment Regarding Requirement for Deposit
of Biological Material | 8. <input type="checkbox"/> Examiner's Statement of Reasons for Allowance |
| | 9. <input type="checkbox"/> Other _____. |

EXAMINER'S AMENDMENT

1. Claims 1-12 are pending in the instant application.
2. An examiner's amendment to the record appears below. Should the changes and/or additions be unacceptable to applicant, an amendment may be filed as provided by 37 CFR 1.312. To ensure consideration of such an amendment, it MUST be submitted no later than the payment of the issue fee.

Authorization for this examiner's amendment was given in a telephone interview with Fredrick Koenig on August 16, 2007.

The application has been amended as follows wherein the following versions of claims 1, 3-7, 9 and 12 replace all prior versions in their entirety and claims 2 and 8 are cancelled.

1. A method for a code division multiple access user equipment comprising:
 - transmitting ~~spread spectrum communication~~ data signals over the a shared spectrum;
 - receiving and sampling a combined signal having the K ~~transmitted~~ data signals over the shared spectrum;
 - producing a combined channel response matrix using codes and impulse responses of the K data signals;
 - determining a block column of a cross correlation matrix using the combined channel response matrix, each block entry of the block column being a K by K matrix;
 - taking a first Fourier transform of a complex conjugate transpose of the combined channel response matrix multiplied ~~to~~ with the combined signal samples;
 - multiplying an inverse of a Fourier transform of each block entry of the block column to a result of the first Fourier transform to produce a Fourier transform of the a data vector; and
 - taking an inverse Fourier transform of the Fourier transform of the data vector ~~Fourier transform~~ to produce data of the K data signals.

2. CANCELLED.

3. The method for a user equipment of claim 1 including using a Cholesky ~~Colicky~~ decomposition of the each block entry ~~entries of the diagonal matrix to determine the data.~~

4. The method for a user equipment of claim 1 including determining the data over a data field time period of a time division duplex communication burst where the combined signal samples extend beyond the data field time period.

5. The method for a user equipment of claim 4 wherein the determining the data uses extended samples of the combined signal samples ~~extends~~ extended beyond the data field time period for a length of an estimated impulse response.

6. The method for a user equipment of claim 4 wherein the determining the data uses combined signal samples that extend beyond the data field time period ~~so~~ such that a length of the combined signals is a length compatible with a prime factor algorithm fast Fourier transform.

7. A code division multiple access user equipment, the user equipment configured to receive a plurality of K data signals over a shared spectrum, the user equipment comprising:

a transmitter configured to transmit ~~spread-spectrum-communication~~ data signals over the shared spectrum;

an antenna configured to receive a combined signal having the K transmitted data signals over the shared spectrum;

a sampling device configured to sample the combined signal;

a channel estimator configured to estimate impulse responses of the K data signals; and

a data detection device configured to produce a combined channel response matrix using codes and the impulse responses of the K data signals; to determine a block column of a cross correlation matrix using the combined channel response matrix, each block entry of the block column being a K by K matrix; to take a first Fourier transform of a complex conjugate transpose of the combined channel response matrix multiplied ~~to~~ with the combined signal samples; to multiply an inverse of a Fourier transform of each block

entry of the block column to a result of the first Fourier transform to produce a Fourier transform of a data vector; and to take an inverse Fourier transform of the Fourier transform of the data vector ~~Fourier transform~~ to produce data of the K data signals.

8. CANCELLED.

9. The user equipment of claim 7 wherein the data detection device is configured to use a ~~Celicky~~ Cholesky decomposition of the each block entries entry of the ~~diagonal matrix to determine the data.~~

12. The user equipment of claim 10 wherein the data detection device is configured to use combined signal samples that extend beyond the data field time period ~~so~~ such that a length of the combined signals is a length compatible with a prime factor algorithm fast Fourier transform.

Claims 1, 3-7, and 9-12 are renumbered respectively as claims 1-10.

Allowable Subject Matter

3. Claims 1, 3-7, and 9-12 renumbered respectively as claims 1-10 are allowed.


Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jason M. Perilla whose telephone number is (571) 272-3055. The examiner can normally be reached on M-F 8-5 EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Chieh M. Fan can be reached on (571) 272-3042. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.


Jason M. Perilla
August 14, 2007

jmp


CHIEH M. FAN
SUPERVISORY PATENT EXAMINER